OPERATOR'S HANDBOOK

NAWC

SOFTWARE PRODUCTION FACILITY

REVISED JAN. 1995

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

1.0 - SCOPE

1.1 - Identification

This Facility complex consist of SUN Microsystems Inc., Microcomputers which are configured into several networks - the **CP-901** network, and the **ASQ-212** network. Each network consist of various systems (subnetworks) of the SUN Microcomputers, which are designed to operate collectively with and/or independently of each other. The structure of these networks are as follows (each system has its own identifier which will appear in parenthesis):

CP-901

3-SUN 4/280's (Kirk, Sarek and Bones), 2-SUN 3/260's (Uhura and Spock),
SUN 3/180 (Chapel), SUN 3/160 (Pike)

ASQ-212

8-SUN 3/60's (Bok, Davis, Duras, Galen, Myers, Nevek, Shelby and Tog),
5-SUN 3/80's (C3po, Chewy, Leia, Luke, and R2d2), 3/180 (Yoda),
2-SUN 3/260's (Data and Wesley), SUN 3/280 (Geordi), SUN 3/470 (Lal),
SUN 4/280 (Sela), 2-SUN 4/330's (Guinan and Pulaski), SUN 4/690 (Crusher),
3-SUN SPARC +1's (Goss, Homn, and Tomalak), SUN SPARC +2 (Troi),
12-SUN SYSTEMS 5's (Gaines, Gates, Hugh, Ishara, Jack, Jessel, Jono, Kargon, Keel, Ragar,
Ro, and Sovak), 7-SUN SYSTEMS 10's (Duffy, Kmpec, Kurn, Mogh, Soong, Temple, Worf),
3-SUN SYSTEMS 20's (Picard,Riker, and Yar), 2-IBM RISC 6000's (Sisko and Odo),
8-IBM X-WINDOWS STATIONS (Bashir, Dax, Jake, Keiko, Kira, Nog, Obrien, and Quark)

1.2 - System Overview

The Software Production Facility (SPF) was developed as a state-of-the-art replacement for the VP's Program Generation Center (PGC). The PGC, created in the 1960's, was established as a support center for the development and maintenance of the P3 mission software for the CP-901 military computer. The SPF allows user generated databases and media to be developed utilizing the **NAWC Ethernet Bridge** thus eliminating the outdated use of program decks, and thereby providing improved utility and user interface processing.

The operating system of the SUN systems is SunOS 4.1.3

The military languages of CMS-2 and CS-1, created for use with the CP-901 military computer, have been incorporated into the SPF systems and are user accessible via system translators.

1.3 - Document Overview

The purpose of this manual is to assist the Operations Staff in executing the fundamental operating procedures of the SPF's computer complex. This manual contains the basic operating commands and procedures required for the day-to-day operation of the SPF's systems. The areas covered in this document encompass the routines unique to the **spfops** and **operator** accounts.

2.0 - Reference Documents

The following documents may be useful to the Operations Staff in the operation phase of their duties, in understanding the operating software and expanding their knowledge of the computer systems.

- *DOD-STD-2167A*
- *UNIX System V Primer*
- *UNIX Primer Plus*
- *SUN System, SunOS 4.1 Reference Manuals Parts 1 through 4*

3.0 - Computer System Operation

The SPF's systems are monitored 24 hours a day, five (5) days per week, Monday through Friday.

3.1 - Computer System Preparation and Shutdown

Each time a system is powered-up, there is a procedure which must be followed step-by-step to ensure the correct preparation of the system for production processing. Conversely, the same is true whenever a system is powered-down; a specific procedure must be followed to ensure a **graceful** "bring-down" of the software system prior to the equipment power-down.

3.1.1 - Power On and Off

Due to the diversity of systems which constitute this Facility, several of these systems have specific procedures which must be followed in powering-up and powering-down the equipment.

3.1.1.1 - Power On/Off SUN 3/60, SUN 3/80, SUN 3/160, SUN 3/260, SUN 3/470, SUN SPARC +1, SUN SPARC +2, SUN SYSTEMS 5's, SUN SYSTEM 10's, SUN SYSTEM 20's, and IBM X-WINDOWS STATIONS

This Facility has eight (8) SUN 3/60, five (5) SUN 3/80, one (1) SUN 3/160, four (4) 3/260, one (1) SUN 3/470, three (3) SUN SPARC +1, one (1) SUN SPARC +2, twelve (12) SUN SYSTEMS 5's, seven (7) SUN SYSTEMS 10's, three (3) SUN SYSTEMS 20's, and eight (8) IBM X-WINDOWS STATIONS computers.

The identifiers of these SUN 3/60 systems are **Bok**, **Davis**, **Duras**, **Galen**, **Myers**, **Nevek**, **Shelby** and **Tog**.

The identifiers of these SUN 3/80 systems are **C3po**, **Chewy**, **Leia**, **Luke**, and **R2d2**.

The identifier for the SUN 3/160 is **Pike**.

The identifiers of these SUN 3/260 systems are **Data**, **Spock**, **Uhura**, and **Wesley**.

The identifier for the SUN 3/470 system is **Lal**.

The identifiers of these SUN SPARC +1 systems are **Goss, Homn, and Tomalak**.

The identifier for the SUN SPARC +2 system is **Troi**.

The identifiers of these SUN SYSTEMS 5's are **Gains**, **Gates**, **Hugh**, **Ishara**, **Jack**, **Jessel**, **Jono**, **Kargon**, **Keel**, **Ragar**, **Ro**, and **Sovak**.

The identifiers of these SUN SYSTEMS 10's are **Duffy**, **Kmpec**, **Kurn**, **Mogh**, **Soong**, **Temple**, and **Worf**.

The identifiers of these SUN SYSTEMS 20's are **Picard**, **Riker**, and **Yar**.

The identifiers of these IBM X-WINDOWS STATIONS are **Bashir**, **Dax**, **Jake**, **Keiko**, **Kira**, **Nog**, **Obrien**, and **Quark**.

POWER ON SUN 3/60, SUN 3/80, SUN 3/160, SUN 3/260, SUN 3/470, SUN SPARC +1, SUN SPARC +2, SUN SYSTEMS 5's, SUN SYSTEM 10's, SUN SYSTEM 20's, and IBM X-WINDOWS STATIONS

- Turn on the power strip (on floor near the system)
- Turn on all peripherals (Printer, monitors, CPUs, pedestals) if not already turned on.

POWER Off SUN 3/60, SUN 3/80, SUN 3/160, SUN 3/260, SUN 3/470, SUN SPARC +1, SUN SPARC +2, SUN SYSTEMS 5's, SUN SYSTEM 10's, SUN SYSTEM 20's, and IBM X-WINDOWS STATIONS

- Login onto the system under the **OPERATOR** account and initiate the halt procedure
- Turn off all peripherals (Printer, monitors, CPUs, pedestals) if not already turned off.
- Turn off power strip (on floor near the system)

3.1.1.2 - Power On/Off SUN 3/180 and SUN 3/280

This Facility has two (2) SUN 3/180 and one (1) SUN 3/280 computers.

The identifiers of these SUN 3/180 systems are **Chapel** and **Yoda**.

The identifier for the SUN 3/280 system is **Geordi**.

POWER ON SUN 3/180 and SUN 3/280

- Turn on circuit breaker (up position) in the back of the unit.
- Turn on all peripherals (Printer, monitors, CPUs, pedestals) if not already turned on.
- Turn on CPU by turning the key, face of cabinet, to the on (horizontal) position if needed.

POWER OFF SUN 3/180 and SUN 3/280

- Login on each system under the **OPERATOR** account and initiate the halt procedure
- Turn off all peripherals (Printer, monitors, CPUs, pedestals)
- Turn off CPU key (face of cabinet)
- Turn off circuit breaker (down position) in the back of the unit.

3.1.1.3 - Power On/Off SUN 4/280 and SUN 4/330

This Facility has four (4) SUN 4/280 and two (2) SUN 4/330 computers.

The identifiers of these SUN 4/280 systems are **Kirk**, **Sarek**, **Bones**, and **Sela**.

The identifiers of these SUN 4/330 systems are **Guinan** and **Pulaski**.

POWER ON SUN 4/280 and SUN 4/330

- Turn on circuit breaker (up position) in the back of the unit.
- Turn on all peripherals (Printer, monitors, CPUs, pedestals) if not already turned on.
- Turn on CPU by turning the key, face of cabinet, to the on (horizontal) position if needed.

POWER OFF SUN 4/280 and SUN 4/330

- Login on each system under the **OPERATOR** account and initiate the halt procedure
- Turn off all peripherals (Printer, monitors, CPUs, pedestals)
- Turn off CPU key (face of cabinet)
- Turn off circuit breaker (down position) in the back of the unit.

3.1.1.4 - Power On/Off SUN 4/690

This Facility has one (1) SUN 4/690.

The identifier for this system is **Crusher**.

POWER ON SUN 4/690

- Turn on **OPTICAL DISK DRIVE**
- Turn on **SMALL DISK DRIVE** in the rear of **Crusher**
- Turn on CRT
- Turn on printers
- Turn on power supply (bottom rear of cabinet) to the left
- Turn on CPU (rear of cabinet)
- Turn key on (horizontal position) inside of Crusher's cabinet if needed

POWER OFF SUN 4/690

- Login onto the system under the **OPERATOR** account and initiate the halt procedure
- Turn off CRT
- Turn off printers
- Turn off power supply (bottom rear of cabinet) to the right
- Turn off CPU (rear of cabinet)
- Turn key off (vertical position) inside of Crusher's cabinet if needed
- Turn off **OPTICAL DISK DRIVE**
- Turn off **SMALL DISK DRIVE** in the rear of **Crusher**

3.1.1.5 - Power On/Off IBM RISC 6000

This Facility has two (2) IBM RISC 6000.

The identifiers for these systems are **Sisko** and **Odo**.

POWER ON THE IBM RISC 6000

- AT circuit panel box 6, Turn on circuit breakers #2 and #9 for the IBM RISC drives of SISKO and ODO respectively.
- Turn on all disk drives.
- IN THE PDU (FRONT DOOR) Turn on circuit breaker # 1-3 marked "SISKO"
- IN THE PDU (NEXT TO CRUSHERLP) Turn on circuit breaker # 23-25 mareked "ODO"
- The System will boot up automatically.

POWER OFF THE IBM RISC 6000

- Log into SISKO's AND ODO's **OPERATOR** account and initiate the halt procedure.
- THE SYSTEMS ARE DOWN WHEN THE FOLLOWING STATEMENT APPEARS: "....HALT COMPLETED...."
- TURN OFF EACH DRIVE.
- PRESS POWER OFF BUTTON on SISKO and ODO.
- At the PDU adjacent to CRUSHERLP, Turn off circuit breaker 23-25.
- At the PDU (FRONT DOOR), Turn off circuit breaker 1-3.
- At the Circuit Panel Box 6, Turn off breakers #2 and #9.

3.1.2 - Initiation

At power up, a specific order must be followed, certain systems (servers) contain information which can be shared among the other systems (clients).

The following subparagraphs will explain the initialization procedures for all of the servers of the VP Facility. See ***Appendix A*** for examples of the general boot process for all SUN systems.

3.1.2.1 - Initializing the SUN 3/280, 2-SUN 4/330, and SUN 4/690 SERVERS

The SUN 4/690 **Crusher**, 2 SUN 4/330 **Guinan** and **Pulaski**, and SUN 3/280 **Geordi** are the first group of servers that must be powered on first. Once **Crusher**, **Guinan**, **Pulaski**, and **Geordi** have been powered on the systems will automatically initialize. No operator intervention/response is required.

3.1.2.2 - Initializing the SUN SPARC +2, 2-SUN SYSTEMS 10's, and 2-SUN SYSTEMS 20's SERVERS

When the above group from 3.1.2.1, are up and online, the SUN SPARC +2 **Troi**, 2-SUN SYSTEMS 10's **Mogh** and **Worf**, and 2-SUN SYSTEMS 20's **Picard** and **Riker** may be powered up. Once **Troi**, **Mogh**, **Worf**, **Picard**, and **Riker** have been powered up the systems will automatically initialize. No operator intervention/response is required.

3.1.2.3 - Initializing the IBM RISC 6000 SERVERS

When the above group from 3.1.2.2, are up and online, the 2-IBM RISC 6000 **Sisko** and **Odo** may be powered up. Once **Sisko** and **Odo** have been powered up the systems will automatically initialize. No operator intervention/response is required.

3.1.2.4 - Initializing the 2-SUN 4/280 SERVERS

When the above group from 3.1.2.3, are up and online, the 2-SUN 4/280's **Kirk** and **Sarek** have been powered up the systems will automatically initialize. No operator intervention/response is required.

3.1.2.5 - Initializing the SUN 3/180 SERVER

With the above group from 3.1.2.4, are up and online, the SUN 3/180 **Yoda** may be powered up. Once **Yoda** has been powered up the system will automatically initialize. No operator intervention/response is required.

3.1.2.6 - Initializing the CLIENTS

Once all of the above steps have been accomplished the rest of the SUN STATIONS and IBM X-WINDOWS STATIONS may be powered on in any order. Once the SUN STATION and IBM X-WINDOWS STATIONS are powered on the automatic boot process will commence. No operator intervention/response is required.

3.1.3 - Shutdown

In the "Shutdown" procedure, as in the "Initiation" procedure, the diversity of computer systems begets a diversity of power-down processes. Each of the shutdown procedures requires operator intervention in order to accomplish a proper termination of the system.

3.1.3.1 - Shutdown of all SUN Stations

Each systems in the CP901 and ASQ-212 group must be brought down "gracefully" prior to the power-down of the equipment. The operator will check the system to determine the extent, if any, of user activity. The operator's time allowance will be determined by the amount of user activity. The procedure for shutdown of the CP901 and ASQ-212 stations are as follows. The operator responses will be in ***bold italics***.

- The shutdown process must be executed via the **operator** account

```
opr> halt
Minutes until halt (1 - 99, 0 to abort) ? 15
Shutdown at 16:15 (in 15 minutes) [pid 657]

opr>
Broadcast Message from kirk!operator (console) at 22:01 ...


  *** System shutdown message from operator%kirk ***

System going down in 15 minutes
```

- A periodic message will be broadcast to all active users until the final minute of the shutdown procedure when the intervals will be more regular.
- When the shutdown time allowance has been exhausted, system will respond as follows,

```
System shutdown time has arrived

Broadcast Message from kirk!operator (console) at 22:16 ...

    *** FINAL System shutdown message from operator%kirk ***

System going down IMMEDIATELY

 Terminated
kirk#


        syncing disks... done

HALTED

>
```

- When the shutdown process reaches this point the equipment can be powered down.

3.2 - Operating Procedures

The operations staff is responsible for responding to user initiated job request for the creation of magnetic media, generation of laser printouts, etc. There is an extensive variety of commands available to the operator for use in executing his position.

3.2.1 - Input and Output Procedures

The magnetic media utilized by the SPF consist of four (4) basic types; tapes, cassettes, 8mm, and cartridges (cartes). The media is "assigned" to the individuals within the user community of the VP Facility structure. The user(s) are solely responsible for requesting regular maintenance on their assigned media in order to guarantee its proper operating condition.

The user(s) submit their request for media generation via a "spooler" routine. Once a job is installed in the "spooler" it is the operators responsibility to execute the process. If the job requires writting to the media, the operator will verify the ownership before executing the job. If the submitted routine request is only reading the tape, ownership is irrelevant.

Each of the primary user development systems (**kirk, sarek** and **crusher**) have "spoolers". These "spoolers" are the means by which users submit their media for creation. The operator will periodically check the "spoolers" for work. When jobs appear in any of these "spoolers", the operator will enter the **operator** account of the appropriate system. Processing is accomplished by initiating the "spooler" with the command, **start** <spooler>. The available "spoolers" are; ***7tape, 9tape, cassette, 8mm*** and ***cartes***. When the "spooler" is initiated the job will appear on the terminal directing the operator to prepare the media for processing. The media is mounted on the drive and the job is executed. Upon successful completion of the process(es), the operator will conclude the function and close the "spooler" with the command, **stop** <spooler>.

Once the media creation has been successfully completed, the media is returned to the library. If, for any reason, the job is unsuccessful, the operator will send an electronic message to, or telephone the user informing them of the cause of failure. Sending of an electronic message is accomplished using the command, **talk** <account name>. If the user is not logged onto the system, electronic **mail** will suffice.

3.2.1.1 - Account Entry

As stated in paragraph 1.3, Document Overview, the operations staff primary responsibility is the activities of the ***spfops*** and the ***operator*** accounts. The user "spoolers" are normally monitored via the **spfops** account; the jobs from the "spoolers" are processed via the **operator** account. There are various means of entering and/or changing accounts.

Upon initial power-up of the system the operator will be prompted to log onto an account with the prompt, **login:**. In order to enter an account, the individual must know the correct account name and the **password**. The accounts contained within a system is information available to any user who has access

to a single account. However, in order to enter an account an individual MUST know the accounts **password**. When entering an account, after the keying in the **account** name, the system will prompt with, **password:**. The account will not open for use unless the appropriate password is entered.

3.2.2 - Monitoring Procedures

As stated in the previous paragraph, the operator checks the "spoolers" on a regular basis. This is accomplished using the command, **qall**. Another area of the user interface which must be checked on a routine basis is the print "spoolers". This is done using the command **lpqs**. Upon entering this command a list of all 12 facility printers, both impact and laser, will appear on the terminal. Included in this list will be activity on any of the printers and any impediments which may be causing the printer(s) to hang.

The operator will also monitor the **filesystems**, using the command **df**, thereby tracking the percentage of capacity for these units. If the capacity should reach a volume of approximately 97%, the operator should notify the Supervisor and/or the System Administrator. In turn, a message will be issued to all appropriate users requesting the deletion of unnecessary data. Should a **filesystem** become full at a time when it is not being monitored by the operator, the console will alert the operator with a loud, repetative "beep".

3.2.2.1 - Malfunctions

In any type of operation, foreseen and unforeseen failures occur. The predictable failures have been documented in the operating routines. In the course of media creation, statements will be echoed to the console. These statements, some routine, must be closely monitored for indications of failures. The operators actions will be dictated by the severity of the failure. Some failures are caused by the users databases; other malfunctions may be in the result of defective media. If a failure occurs that is not documented, i.e., a failure which has never occurred before, the Supervisor, Facility Manager and/or the System Administrator must be contacted before proceeding. Failures of the printers can only be detected by checking the queue. Since the majority of printers are located outside of the immediate operations area, regular visual checks of the queues and physical checks of the printers must be performed. A visual check of the printer queues will give an indication of a failure but only physical presence can correct the problem.

3.2.2.2 - Emergency Shutdown Conditions

There are three (3) primary conditions which may cause any emergency shutdown of the SPF systems. With the first two (2), a system crash or a power glitch, there will be no direct indications via the console(s). A system crash will compromise the information contained on the pack(s) and thus result in undefinable information. A power glitch will cause the facility lights to flicker and may, in extreme cases, causing some jobs to abort. In the summer months more attention must be paid to power glitchs since they are a result of electrical storms. Only a PDU failure will alert the operator of impending danger. The PDU system will begin to "beep" when a failure occurs. When this happens the operator only has to hit the **"emergency stop"** button.

3.2.2.3 - Additional Monitoring Procedures

The operator has several options available which enable him, whenever necessary, to interrupt and/or discontinue processing. A more detailed explanation of these commands is outlined in ***Appendix C***.

3.2.3 - Recovery Procedures

The operating systems of the SPF computers, being state-of-the-art, for the most part have built in recovery procedures. The equipment, however, being peripherals of the systems does not always meet that criteria.

Whenever a media create is established, the possibility of failure exists. When a failure does occur the operator must attempt to determine the source of the failure. The first area to investigate is the media. If it is determined that the media is not at fault, the equipment must be checked to ensure that it is not the source of the problem. The final suspect area remaining is the users database. If the media and equipment are eliminated from fault, the job is terminated and the user is informed of the probable cause of failure.

The operating systems of the SPF computers have built in recovery routines for various failures. A **system boot** failure will automatically initiate a "re-boot". A general system failure during an individuals involvement with the **visual editor**, for instance will activate the softwares editor recovery routine enabling the user to confidently recoup his file once the system is back on line.

3.2.3.1 - Restarting the System

In the event one of the system failure predicaments occur, i.e., system crash, power glitch, PDU failure, etc., the operator will inform the System Administrator. Once the problem has been resolved, the system will be brought back on-line. This procedure is the same as the initial boot process **(see paragraph 3.1.2 - Initiation)**.

3.2.3.2 - Record Keeping

All problems, regardless of severity, are throughly recorded by the operations staff. Documentation requirements include system logs, shift reports, and the use of **E Mail** to inform the Facility Management and the System Administrator of important occurrences. Shift turnaround includes dialogue between shift leaders to recap the events of the previous shift and preview the probabilities for the upcoming shift.

3.2.4 - Off-Line Routine

This system, being a highly self-sufficient computer, does not contain any relevant off-line routines.

3.2.5 - Other Procedures

As outlined previously, the SPF systems are monitored continuously by the operators. However, there are routines performed daily beyond those of direct user assistance.

The most important non-user related task performed by the operations staff is the system dumps. These system dumps are essential to the day-to-day SPF operation. The users can be secure in the knowledge that their files have no less than a 24 hour backup guarantee. If for any reason a user should lose a file they have only to request a reload of the most recent dump, citing the last usage of that particular file. The Facility itself has the dumps as a safeguard to a disk crash or, in a worse-case scenario, a total system failure.

The dumps, performed primarily during the 2nd and 3rd shifts, are of two (2) formats, ***incremental*** and ***full***. The incremental dumps are done nightly and consist of any **filesystems** which have been modified since the last full dump. The amount of time consumed by the incremental dumps will vary in accordance with the amount of activity realized on the various filesystems. The full dumps are done every Thursday evening into Friday morning. These dumps encompass every **filesystem** available in the SPF computers, whether or not there has been activity on them. The average amount of time consumed to perform full dumps is is 15 - 25 hours.

These dump routines are performed via the **operator** account. The dump routine is initiated by a menu choice and the operator need only follow the instructions of the dump routine.

The other procedure, the responsibility of the Operations Supervisor, is the periodic changing of the account(s) **password(s)**. In the interest of Facility Security, passwords are changed regularly or whenever necessary, such as when an employee terminates or if it is suspected that system security may have been compromised.

4.0 - Diagnostic Features

4.1 - Diagnostic Features Summary

The SPF computer systems have internal diagnostic procedures which are activated upon the execution of the boot process. These diagnostics are designed to test the software, et. el., and advise the operator that a failure has occurred. Examples of these conditions can be found in **Appendix A**.

4.2 - Diagnostic Procedures

The few diagnostic procedures that are available to the operator are solely for the printers, i.e., line printers, lasers and decwriters. The operations staff can also run diagnostics on user media to determine the condition of said media in the event of creation and/or testing failures.

4.2.1 - Line Printer Test

4.2.1.1 - Data Products Printer

- Take printer off-line (receive code 88).
- Lift lid; set top toggle switch to the down position.
- At **code 67**, put line printer on-line to receive a "character set" print.
- To discontinue testing, take printer off-line.
- Set toggle switch to middle position.
- Reset printer to on-line position.

4.2.1.2 - System Industries Printer

- Take the printer off-line.
- At **mode selection**, set switch to ***test*** (the green light will come on).
- Place printer back on-line and the character set listing will begin.
- To discontinue testing, take printer off-line.
- Set **mode selection** back to ***normal***.
- Reset printer to the on-line position

4.2.2 - Laser Printer Test

4.2.2.1 - DATAPRODUCTS LZR 1560 and APPLE WRITER II

- Turning the laser printer off for a few seconds, and then turning it back on produces a test sheet of the laser printer
- The test sheet produced by the laser contains important information about the laser printer

4.2.2 - DMTU/Media Test

- Turn on DMTS and DMTU.
- Insert a cassette into the DMTU.
- Cycle DMTU power off & on.
- At DMTS I/O select, ensure that the unit is in the **off-line** mode.
- Press DMTS INIT button; ***left*** INIT button for Controller #1, ***right*** INIT button for Controller #2.
- Check controller and drive;
    1. For Controller #1, keep the letter select on the ***top*** line.
    2. For Controller #2, Keep the letter select on the ***bottom*** line.
- At the I/O select, set the controller in use to ***CP901***.
- Under the Controller 1 display window, press ***SEL MOD*** for mode display.
- At mode display, select DMTU.
- Again at mode display, make appropriate test selection.
- Use the ***halt*** selection for stopping or for changing test pattern.

4.2.3 - Kennedy Drive Test

This test can be executed separately or in groups, by drive.

- Mount blank scratch tape(s) on the drive(s) to be tested
- Load tape; keeping the drive in the **off-line** position
- To view test selection, lift the density setting panel above the drive
- Select test button
- Select cycle button; this will run a write/read pattern to the scratch tape (Allow approximately 1 to 2 minutes to thoroughly test drive)
- Select the stop button
- Select the test mode button
- Rewind the tape(s) to **BOT**; dismount tapes

APPENDIX A

10.0 - BOOT EXAMPLE FOR SUN STATION

```
SunOS Release 4.0.3 (kirk) #56: Mon Aug 20 16:52:53 EDT 1990
Copyright (c) 1989 by Sun Microsystems, Inc.
mem = 32768K (0x2000000)
avail mem = 31596544
Ethernet address = 8:0:20:0:16:39
xdc0 at vme16d32 0xee80 vec 0x44
xd0 at xdc0 slave 0
xd0: <CDC 9720-1230 cyl 1633 alt 2 hd 15 sec 82>
xdc1 at vme16d32 0xee90 vec 0x45
xd4 at xdc1 slave 0
xd4: <CDC 9720-1230 cyl 1633 alt 2 hd 15 sec 82>
xtc0 at vme16d16 0xee60 vec 0x64
xt0 at xtc0 slave 0
zs0 at obio 0xf1000000 pri 3
zs1 at obio 0xf0000000 pri 3
ie0 at obio 0xf6000000 pri 3
cgtwo0 at vme24d16 0x400000 vec 0xa8
cgtwo0: Sun-3 color board, fast read
bwtwo0 at obio 0xfd000000 pri 4
bwtwo0: resolution 1152 x 900
addr = ff166000, unit = 0, cnt = 0
nt0 at vme24d16 0xd00000 vec 0xc8
addr = ff176000, unit = 1, cnt = 1
addr = ff176000, unit = 2, cnt = 2
nt2 at vme24d16 0xd20000 vec 0xca
addr = ff186000, unit = 3, cnt = 3
root on xd0a fstype 4.2
swap on xd0b fstype spec size 75030K
dump on xd0b fstype spec
Oracle instance started
Database mounted
Database opened
Total system global area                  784888 bytes
Fixed size                                 25356 bytes
Variable size                             317164 bytes
Database buffers                          409600 bytes
Redo buffers                               32768 bytes
SQL:DBA Complete
Database "A" warm started
Oracle
Link-editor directory
Adding-/dev/xd4b as swap drive
preserving editor files
```

```
cleaning /tmp
standard daemons: update cron accounting uucp
starting network daemons: rehod inetd printer spooler
Tue Jan 8 09:03:20 EST 1991
login:
```

END OF EXAMPLE

APPENDIX B

20.0 - EXAMPLE OF POSSIBLE BOOT FAILURES

Check for any negative system responses appearing in the BOOT echo to the console, such as:

"CAN'T" OR "UNEXPECTED" OR "NOT FOUND"

```
Automatic reboot in progress...
Tue Aug 23 21:31:54 EDT 1988
/dev/hp0a: 1057 files, 5666 used, 1763 free (27 frags, 217 blocks, 0.4%
                                                    fragmentation)
/dev/rhp10a: 45 files, 197 used, 7232 free (56 frags, 897 blocks, 0.8%
                                                    fragmentation)
/dev/rhp0g: 9391 files, 63153 used, 11470 free (502 frags, 1371 blocks, 0.7%
                                                    fragmentation)
/dev/rhp0h: 12709 files, 108074 used, 29422 free, (2350 frags, 3384 blocks,
                                                  1.7% fragmentation)

Can't open /dev/rhp2c
/dev/rhp2c: CAN'T CHECK FILE SYSTEM.
/dev/rhp2c: UNEXPECTED INCONSISTENCY; RUN FSCK MANUALLY.CAN'T OPEN /DEV/RHP6C
/dev/rhp6c: CAN'T CHECK FILE SYSTEM.
/dev/rhp6c: UNEXPECTED INCONSISTENCY; RUN FSCK MANUALLY.
/dev/rhp12c: 640 files, 133983 used, 101968 free (128 frags, 12730 blocks,
                                                  0.1% fragmentation)
/dev/rhp14c: 870 files, 53172 used, 182779 free (499 frags, 22785 blocks, 0.2%
                                                    fragmentation)
/dev/rhp16c: 6076 files, 201507 used, 34444 free (4556 frags, 3736 blocks,
                                                  1.9% fragmentation)

CAN'T OPEN /DEV/RHP1C
/dev/rhp1c: CAN'T CHECK FILE SYSTEM. CAN'T OPEN /DEV/RHP4C
/dev/rhp4c: CAN'T CHECK FILE SYSTEM.
/dev/rhp4c: UNEXPECTED INCONSISTENCY; RUN FSCK MANUALLY.
/dev/rhp1c: UNEXPECTED INCONSISTENCY; RUN FSCK MANUALLY.
/dev/rhp13c: 4423 files, 75220 used, 160731 free (587 frags, 20018 blocks,
                                                  0.2% fragmentation)
/dev/rhp9c: 7319 files, 196573 used, 39378 free (1178 frags, 4775 blocks, 0.5%
                                                    fragmentation)
/dev/rhp10g: 154 files, 819 used, 73804 free (204 frags, 9200 blocks, 0.3%
                                                    fragmentation)
/dev/rhp10h: 7887 files, 106447 used, 31049 free (385 frags, 3833 blocks, 0.3%
                                                    fragmentation)

Can't open /dev/rhp3c
/dev/rhp3c: CAN'T CHECK FILE SYSTEM.
/dev/rhp3c: UNEXPECTED INCONSISTENCY; RUN FSCK MANUALLY.
Can't open /dev/rhp5c
/dev/rhp5c: CAN'T CHECK FILE SYSTEM.
/dev/rhp5c: UNEXPECTED INCONSISTENCY; RUN FSCK MANUALLY.
/dev/rhp11c: 4723 files, 175155 used, 60796 free (660 frags, 7517 blocks, 0.3%
                                                    fragmentation)
/dev/rhp15c: 11525 files, 189037 used, 46914 free (1938 frags, 5622 blocks,
                                                  0.8% fragmentation)
```

```
Automatic reboot failed...help!
-: stty: NOT FOUND
-: tset: NOT FOUND
-: clear: NOT FOUND
-: /usr/fasp/setup: NOT FOUND
VAX0>
VAX0>wed Aug 17 22:31:47 EDT 1988
Adding /dev/hp10b as swap device
Adding /dev/hp17c as swap device
/dev/hp1c on /orssw: NO SUCH DEVICE OR ADDRESS
/dev/hp2c on /stpsw/base: NO SUCH DEVICE OR ADDRESS
/dev/hp3c on /opssw/U2: NO SUCH FILE OR DIRECTORY
/dev/hp5c on /opssw/U3: NO SUCH FILE OR DIRECTORY
/dev/hp4c on /opssw/U3/1461: NO SUCH FILE OR DIRECTORY
/dev/hp6c on /fms: NO SUCH DEVICE OR ADDRESS
/dev/hp13c on /opssw/U2/base: NO SUCH FILE OR DIRECTORY
/dev/hp14c on /opssw/U3/cmos: NO SUCH FILE OR DIRECTORY
/dev/hp15c on /opssw/U3 base: NO SUCH FILE OR DIRECTORY
/dev/hp15c on /opssw/U2/I47: NO SUCH FILE OR DIRECTORY
checking quotas: done.
starting system logger
checking for core dump... /a/crash: NO SUCH FILE OR DIRECTORY

starting local daemons: named sendmail.
preserving editor files
clear /tmp
Aug 17 22:32:06 sulu savecore: /a/crash: NO SUCH FILE OR DIRECTORY
Aug 17 22:32:09 sulu named[74]: /etc/named.boot: NO SUCH FILE OR DIRECTORY
standard daemons: update cron accounting.
starting network daemons: rwhod inetd printer.
Wed Aug 17 22:32:27 EDT 1988
```

END OF EXAMPLE

If failures such as those indicated in ***italics*** occur during the BOOT procedure, a re-BOOT must be attempted. If the failures persist, the System Administrator must be notified.

APPENDIX C

30.0 - COMMANDS FOR SYSTEM OPERATIONS

These UNIX commands and files, available at the **spfops** level, follow the format **command<RETURN>**, (where **<RETURN>** indicates a carriage return).

mail root - The identifier **root** is the login name of the System Administrator. Use to report system problems to the System Administrator. After entering this command, the system will prompt with 'Subject:'; the Operator responds with the type of problem and hits **<RETURN>**; then explain the problem. After recording message, hit .(period), and the system will prompt 'Cc:'; respond to this prompt by entering: root, any other required accounts, and spfops (for operations record). Whenever you send mail about a system crashing, make sure to include all information about "what the system was doing" at the time of the crash. i.e. Kirk, Full dumps, File system executing

mail - To read any messages under mail in host account. To access a particular message, enter its number and hit **<RETURN>**. After reading messages, respond with an 'quit' to save mail to a file called **mbox** or respond with 'exit' to leave as an active message.

/etc/motd - This is the ***M****essage* ***O****f* ***T****he* ***D****ay*. The message appears on the CRT screen at login time. May view at any time by using the **cat** command.

EXAMPLE: **cat /etc/motd** for UPDATE III (must be logged on an Update III system.)
cat /etc/motd for AN/ASQ-212 (must be logged on an AN/ASQ-212 system.)

LDRops - ***RECOMMENDED AS AN OPERATIONS ASSISTANCE TOOL.***
Establish file in the **'spfops'** account. Use to relay important information to the Operations Staff. Append new information to this file daily. Operations Staff reviews this file at the beginning of each shift.

CNTRL-D - To leave the remote system connection and return to the original system. For example, to leave **wesley** and return to **troi**.

CNTRL-C - To regain keyboard control when hung. Use as a means to break off an active process such as a **cat** command or a **man** command after the required information has been extracted. Once executed successfully, the host accounts prompt will appear.

ps -agx - Use to check current processes that are affecting the control of the system and/or tape drives. Processes with the **rmt** designator (9 Track ONLY) will indicate current activity involving system tape unit(s).

stat <spooler> - Status of the particular spooler queue indicated.

stat - Status of all current activity in the spooler queue of the host system.

lpq - Status of the default print queue of the host system.

lpqs - Status of print queues on all systems.

lpr -P device <filename> - To send a specific job **(filename)** to a specific printer **(device)**.

lpr <filename> - To send the specified job **(filename)** to the printer of the host system.

pwd - To identify present working directory (determine directory level(s)).

whoaml - Responds with the name of the login account.

who am I - Responds with the login account, device, date and time of login, and the host system.

users - Display a list of the logged-in users in a one (1) line format.

[w]ho - List the user, device name, and the time of login.

hostname - Name of system currently accessing.

rlogin system name - remote login to the named system.

or

system name - when connecting to another host.

or

system name -l login name - also when connecting to another host.

date - To view the current date and exact time.

date - To view the current date and exact time.

uptime - The current time, time period system has been up, number of current users, load averages.

ruptime - Gives the status line like **uptime** for each machine on the local network.

30.1 - Operator account level command menu

```
() - may use first letter in place of full name
Valid commands for Local Opser are:

COMMANDS                EXPLANATION

!sh                - shell escape (execute UNIX commands)
                     (Type CNTRL-d to return from shell)
                     Currently only available at the "root" level
(u)sers            - show logged in users
wall               - notify users
(h)elp             - print this help message (operator's menu)
(b)ackup           - file system backup (procedure)
restore            - restore file/directory
(l)pc              - invoke the lpc program (procedure)
halt               - halt processor
date               - set the system time
chk_dates          - check dates on all machines
spoold             - invoke the spoold program
spoolc             - invoke the spoolc program (procedure)
stat               - get status of the spooler queues
lpqs               - get status of the printer queues
spoolrm            - remove a job from a spooler queue
lprm               - remove a job from a printer queue
print_full         - print Full_log
print_inc          - print Inc_log
(r)mt              - kill any existing rmt process
up_oracle          - bring ORACLE up
down_oracle        - bring ORACLE down
(q)uit             - exit from opser
```